

REMARKS

The only issue outstanding in the Office Action mailed September 3, 2008, is the rejection of all claims under 35 U.S.C. § 103 over Ishizuka taken with Eguchi. Reconsideration of this rejection is respectfully requested.

The claims have been clarified in order to note that the monolithic porous molding produced has an internal diameter of 0.5 to 50 mm, as disclosed in the present specification at page 7, lines 2-4. It is thus evident that the present process is engineered so as to produce moldings which are of a different nature than those of Ishizuka, in which capillaries with a diameter of just 100µm are produced. See page 372, first column, second paragraph. As disclosed in Ishizuka, during production of silica columns voids can develop between the silica structure and the capillary wall, due to shrinkage taking place during the sol gel process as the gel is aged. Such is a well known phenomenon, as Ishizuka indicates noting reference 11, and as noted in the present specification on page 1, lines 25-35 and page 2, lines 9-20. Moreover, as noted in page 2 of the specification at lines 22-27, prior art solutions for this problem addressed only situations where relatively small diameter columns, such as those of the primary reference, are employed.

It would be apparent to one of ordinary skill in the art that the problem of shrinkage would increase with increasing column diameter. In capillaries with small diameters, the shrinkage rate is low so that no voids develop, but where the diameter of the gelation mould is enlarged, shrinkage of the gel leads to comparatively large voids with the result that before the present process, monolithic moldings with large diameters needed to be removed from the gelation mould and put in a tight cladding before use. For example, assuming a shrinkage rate of about 10%, a realistic estimation, a capillary of 100µm would experience macropores of about 10µm (see, for example, Ishizuka at page 373, second column, last paragraph) which are small enough that they are not considered as void volume. However, where the diameter of gelation mould is on the order of millimeter, 10% shrinkage would result in voids on the average of

100 μ m, which dead space would negatively affect column efficiency. Because Ishizuka employs a comparatively small capillary diameter, shrinkage is not as much of a factor therein. Consequently, the authors do not discuss in detail the problem of shrinkage, nor propose a solution therefor. As a result, in view of the expectation in the art that large moldings would face shrinkage problems, it would not be obvious to one of ordinary skill in the art to expand the process of Ishizuka to one which is engineered to produce moldings on the order of 0.5 to 50mm.

Eguchi fails to remedy in this deficiency, in as much as it is directed to the production of sorbent layers, in other words, the production of capillaries which are not totally filled with sorbent (i.e., monolithic) but only coated. For example, see claim 1. As a result, patentees do not address the issue of void volumes inasmuch as, in a capillary which is only coated, there is always open space in the middle. Although patentees discuss generation of thicker sorbent layers (see, for example, column 1, lines 63-65 and column 2, lines 17-24) patentees do not fill the capillary completely, as is evident. In addition, Eguchi et al. disclose only polymeric organic sorbents, which organic polymers typically do not shrink (note the discussion on page 1, line 25 through page 2, line 7 of the present specification). Moreover, comparable to the primary reference, Eguchi discloses capillaries which have internal diameters of just a few microns, see the abstract. As a result, both primary and secondary references fail to disclose the production of large size monolithic moldings as in the present invention, and do nothing to dispel the notion of one of ordinary skill in the art that, even if their process was to be combined, the resultant materials would experience the typical shrinkage problems to which large size capillaries are prone. As a result, even if one of ordinary skill in the art were to combine the references, the production of capillaries of the size presently claimed would not have been obvious to one of ordinary skill in the art. Accordingly, withdrawal of the rejection is respectfully requested.

The claims of the application are submitted to be in condition for allowance. However, if the Examiner has questions or comments, he is cordially invited to telephone the undersigned at the number below.

The Commissioner is hereby authorized to charge any fees associated with this response

or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

Harry B. Shubin, Reg. No. 32,004
Attorney/Agent for Applicant(s)

MILLEN, WHITE, ZELANO
& BRANIGAN, P.C.
Arlington Courthouse Plaza 1, Suite 1400
2200 Clarendon Boulevard
Arlington, Virginia 22201
Telephone: (703) 243-6333
Facsimile: (703) 243-6410

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